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10/564,855	01/17/2006	Matthias Maase	284676US0PCT	5106
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER VALENROD, YEVGENY				
ART UNIT		PAPER NUMBER		
1621				
NOTIFICATION DATE		DELIVERY MODE		
04/11/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/564,855

**Applicant(s)**

MAASE ET AL.

**Examiner**

YEVEGENY VALENROD

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 6 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 8-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

Rejection of claims 1-6 and 8-12 under 35 USC 112 2<sup>nd</sup> paragraph is withdrawn in view of applicants amendment.

Applicants REQUEST FOR RECONSIDERATION filed on 1/4/08 has been fully considered by the Examiner. The arguments presented by the Applicant have not been found persuasive. Rejection under 35 USC 103(a) made over Hugo et al in view of Bockmann et al. is maintained. The text of the rejection is repeated below, followed by Examiners response to the Applicant's arguments.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hugo (US 3,187,057) in view of Bockmann et al (US 4,276,321).

Instant claim 1 is comprises 2 steps. 1) Preparation of a substituted trichloromethyl aromatic. 2) Partial hydrolysis of the said aromatic to obtain a corresponding acid chloride. The two steps as claimed by the applicant are not taught in a single reference.

Scope of prior art

Hugo teaches preparation of trichloromethyl polymethyl benzenes. In column3, Example 1 Hugo describes preparation of trichloromethyl pentamethylbenzene from pentamethyl benzene. The said preparation is carried out in carbon tetrachloride (column 3, line 35-36), in the presence of aluminum chloride (column 3, line 34). After the conversion is deemed complete water is added to the reaction (column 3, lines 45-46 aq. HCl is added; lines 48-49, water is added). Hugo meets all the limitations of Step 1 of the claimed process. Hugo also recognizes that CCl<sub>4</sub> can be removed via distillation (column 3, lines 51-52)

Bockmann teaches preparation of optionally substituted benzoyl chloride by reacting optionally benzotrichloride (trichloromethyl benzene) with water in the presence of a catalyst. Column 6, example 2 illustrates reaction of benzotrichloride with aqueous

sulfuric acid that produces benzoyl chloride. In Example 4, p-chloro-benzoyl chloride is produced in water using iron(II) sulfate as a catalyst. Bockmann also teaches that his invention encompasses trichloromethyl benzene substrates that are substituted with alkyl groups (column 1, lines 54-55) and lists  $\text{FeCl}_3$  as a preferred catalyst for the process (column 2, line 22-23).

Ascertaining the difference

Neither Bockmann nor Hugo teaches both steps of the claimed process in a single reference. Neither Bockmann nor Hugo teaches adding aqueous organic phase from step 1 to the process of step 2. Since the aqueous organic phase from step 1 is not present in step 2,  $\text{CCl}_4$  that was used in step 1 is also not present in step 2. The distillation process that is used to collect water-free  $\text{CCl}_4$  in step 2 is not present.

Ascertaining the skill of one of ordinary skill in the arts

An organic chemist with a few years or an advanced degree is a person of ordinary skill in the art. Such skill would encompass ability to alter reaction conditions to achieve the desired effect, be it yield, cost or purity involved in the process. One of ordinary skill in the art is capable of finding the said conditions through varying temperature and relative concentration of the reagents. One of ordinary skill in the art is also capable of performing multistep syntheses and optimizing all or any individual steps when procedures for synthetic steps involved are known.

Obviousness

Combining the steps:

The two steps involved in the claimed process are known. A person of ordinary skill in the art wishing to practice the invention of Bockmann would invariably require a method of obtaining the starting material. Hugo teaches a method for obtaining the said starting material and one skilled in the arts would be motivated to utilize Hugo's method because Hugo demonstrated variability in substrates and moderate to high yields for his method.

Recycling of Water/ $\text{CCl}_4$  from the first to the second step.

In combining two synthetic steps it is common and desirable in the art not to perform purification after the first step. Doing so makes the process faster and cheaper. One of ordinary skill wishing to combine Steps 1 and 2 as taught by Hugo and Bockmann would be motivated use the water/ $\text{CCl}_4$  mixture from the first step as a source of water for the partial hydrolysis in the second step.

Distillation of  $\text{CCl}_4$

Bockmann does not teach collecting distilled  $\text{CCl}_4$  because  $\text{CCl}_4$  is not present in his process. Hugo on the other hand does teach distilling  $\text{CCl}_4$  and there is financial incentive to collect  $\text{CCl}_4$  and reuse it. Once the two inventions have been combined one of ordinary skill in the art would be motivated to reduce waste and reuse the solvent. To accomplish that one would be motivated to distill  $\text{CCl}_4$  as suggested by Hugo and collect it for further use.

Temperature and concentrations

One of ordinary skill in the art would be motivated to alter temperature and the concentrations of the reagents in order to find the optimal conditions for the process.

***Examiners response to Applicant's arguments***

Applicant has made the following arguments:

- 1) An aqueous organic phase from the hydrolysis of the  $\text{AlCl}_3$  complex being used in the hydrolysis of TMBT is not taught in the prior art.
- 2) Applicant argues that separation of carbon tetrachloride after formation of TMBC is not taught in the prior art and is not obvious over prior art.
- 3) Applicant states that of carbon tetrachloride after production of TMBC produces a superior quality carbon tetrachloride when compared to the distillation after hydrolysis of  $\text{AlCl}_3$ . In other words by carrying carbon tetrachloride through the end of preparation of TMBC a purer quality of carbon tetrachloride can be obtained via distillation.

Examiners reply:

- 1) In Example 5, where applicant prepares TMBC without isolation of TMBT, the lower organic phase from the production of TMBC is removed (page 10 lines 19-21) and used in the subsequent reaction. The example does not say **aqueous organic phase**. Applicant argues that the references do not teach use of the aqueous organic phase in the hydrolysis of TMBT. Examiner agrees with the applicant that Hugo purifies the final product (the TMBT) and Bockmann uses pure TMBT in his hydrolysis process. However, in combining the two processes one of ordinary skill in the art would expect

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the reaction both reaction to function as described in prior art and produce TMBC as prior art suggests. The fact that hydrolysis works without purification of TMBT is not an unexpected result. Applicants' procedure (see example 5) adds all the reagents required for hydrolysis:  $\text{FeCl}_3$  and water to a solution comprising the substrate for the hydrolysis (TMBT). The expected result is that the TMBT will be hydrolyzed to produce TMBC, which is what the applicants have observed. Another possible unexpected result is the distillation of water-free carbon tetrachloride at the end of the process. This will be discussed in section 3) of this reply.

2) Examiner agrees with the applicant regarding the statement that Bockman does not teach separation of carbon tetrachloride after performing hydrolysis. There is no need of Bochman to do so since no carbon tetrachloride is used in his procedure. However, Hugo does teach removal of carbon tetrachloride via distillation. One of ordinary skill in the art would be motivated to remove carbon tetrachloride at any desirable stage in the process including after the final product is formed.

3) Applicant's claimed invention includes recovery of water-free carbon tetrachloride via distillation. In arguments on page 9, last paragraph, Applicant states that the carbon tetrachloride obtained by practicing the claimed invention is dry enough to be recycled into the Friedel-Crafts alkylation (not acylation as recited by the Applicant). Applicant states that the amount of water in the aqueous organic phase is reduced by the hydrolysis process and it is therefore possible to obtain water-free carbon tetrachloride.

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According to the applicant, had the amount water not been reduced by the hydrolysis step the  $\text{CCl}_4$ /water azeotrope would not produce water-free carbon tetrachloride. However, in example 5, on page 10 of the specification, applicant describes adding additional demineralized water to the reaction flask and then proceeds to distill the carbon tetrachloride (lines 24-27). So, even though the amount of water present in the aqueous organic phase has been reduced, additional water has been added and carbon tetrachloride is distilled therefrom. According to applicants' example 5, it is not necessary to remove water from the final mixture in order to obtain carbon tetrachloride.

In conclusion, the claimed process is obvious. It is obvious to combine Bockman and Hugo without purifying the intermediate because one would expect the process to function as described and would be motivated to cut out an unnecessary step. It is obvious to distill carbon tetrachloride in order to recover it for further use. The argument that decreasing the amount of water in the aqueous-organic phase is crucial for distillation of carbon tetrachloride is not supported by applicants' example 5. Furthermore, Applicants do not provide data concerning the purity of the distilled carbon tetrachloride and do not provide an example where the said carbon tetrachloride is recycled into the Friedel-Crafts alkylation step.

### ***Conclusion***

Claims 1-6 and 8-12 are pending

Claims 1-6 and 8-12 are rejected

This action is a **final rejection** and is intended to close the prosecution of this application. Applicant's reply under 37 CFR 1.113 to this action is limited either to an appeal to the Board of Patent Appeals and Interferences or to an amendment complying with the requirements set forth below.

If applicant should desire to appeal any rejection made by the examiner, a Notice of Appeal must be filed within the period for reply identifying the rejected claim or claims appealed. The Notice of Appeal must be accompanied by the required appeal fee.

If applicant should desire to file an amendment, entry of a proposed amendment after final rejection cannot be made as a matter of right unless it merely cancels claims or complies with a formal requirement made earlier. Amendments touching the merits of the application which otherwise might not be proper may be admitted upon a showing a good and sufficient reasons why they are necessary and why they were not presented earlier.

A reply under 37 CFR 1.113 to a final rejection must include the appeal from, or cancellation of, each rejected claim. The filing of an amendment after final rejection, whether or not it is entered, does not stop the running of the statutory period for reply to the final rejection unless the examiner holds the claims to be in condition for allowance. Accordingly, if a Notice of Appeal has not been filed properly within the period for reply, or any extension of this period obtained under either 37 CFR 1.136(a) or (b), the application will become abandoned.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yevgeny Valenrod whose telephone number is 571-272-9049. The examiner can normally be reached on 8:30am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yevgeny Valenrod/

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